SEMESTER VII

I.   MAJOR COURSE- MJ 16:
BIOINFORMATICS **& COMPUTATIONAL BIOLOGY**

Marks: 25 (5 Attd. + 20 SIE: 1Hr) + 75 (ESE: 3Hrs) = 100	Pass Marks: Th (SIE + ESE) = 40

(Credits: Theory-04) **60 Hours**

Course Objectives:
1. To familiarize the students with the fundamental principles of Bioinformatics and Computational biology.
2. Various potential application of Bioinformatics and Computational tools in biology.

Course Learning Outcomes:
1. Ability to carry out research /investigation independently in specialized area of Bioinformatics and Computational Biology.

Course Content:
Bioinformatics   **(30 Lectures)**
1. Bioinformatics: Introduction – genomics – transcriptome – proteome.
2. Biological databases: Generalized and specialized databases – DNA, protein and carbohydrate databases – nucleic acid sequence databases – premier institutes for databases – nucleic acid codes used in database formats; Collection and down loading of information from databases – literature search.
3. Sequence alignment and its evolutionary basis: Simple alignment and multiple sequence alignment - searching the database for sequence similarity – search programmes with special reference to FASTA, BLAST, CLUSTAL W. Application of bioinformatics in phylogenetic analysis.

Computational Biology   **(30 lectures)**
1. Computer assisted drug design- concept, methods and practical approaches.
2. Diagrammatic, graphical and tabular representations of data; measures of central tendency, dispersion, skewness and kurtosis.
3. Basic concepts of hypothesis testing, two kinds of error, level significance, p value, t- Test for mean and difference between two means, partial t-test., and Chi square test for goodness of fit.

Reference Books
1. Xiong, Essential Bioinformatics, Cambridge University Press.
2. Marketa J Zvelebil, Understanding Bioinformatics, Garland Sciences.
3. Shui Quing Ye, Bioinformatics: A practical approach.
4. Anna Tramantano, Introduction to Bioinformatics.
5. David W Mount, Bioinformatics. CBS.
6. Mani K and Vijayaraj N, Bioinformatics, Kalaikathir Achchagam.